has any relation to the luxuriant or to the meager development of the plants; so the problem remains unsolved why certain species live exclusively on the salt beach in contact with salts. If it is solvable, CASU says the clue must doubtless be sought in a profound and accurate study of the histological structure of the halophyte itself. To us that sounds hopeless.—C. R. B.

Polymorphism of Hymenomycetes.—LYMAN[10] has made culture studies of certain Hymenomycetes, giving especial attention to woody and incrusting species, the primary object of the research being to obtain further knowledge of polymorphism in the group. The summarized results contain the following facts. The basidiospores of about 75 species of Polyporaceae, Hydnaceae, and Thelephoraceae were germinated and grown in pure cultures, and about 40 per cent. of them were found to possess some secondary method of reproduction, usually mycelial oidia or chlamydospores. Oidia were not found among the Thelephoraceae and Hydnaceae, but were produced by one-half of the species of Polyporaceae studied. Chlamydospores have been known in a few agarics and in a considerable number of Polyporaceae, but, aside from certain doubtful cases, were not known among the lower Hymenomycetes. The author found them much more common, especially upon the mycelium, than was known previously, finding them in over one-fourth of the species cultivated. Conidia or other rather highly specialized secondary methods of reproduction were found in seven species, all belonging to Thelephoraceae except Lentodium. The general conclusions are that a considerable majority of Hymenomycetes possess no secondary spores; that oidia are common among the Agaricaceae and Polyporaceae, and are confined to these two families; that chlamydospores occasionally occur in connection with the basidio-fructification, and are quite widely distributed on the mycelia of all families; and that conidia and other highly specialized secondary methods of reproduction are rare, occurring more frequently in the Thelephoraceae than in the higher families.—J. M. C.

Precipitin and relationship.—The precipitin reaction discovered by KRAUS and more fully marked out by TSCHISTOWITSCH and BORDET, and others, has been used by MAGNUS and FRIEDENTHAL[11] in an attempt to show experimentally the relationship of plants. The experiments were conducted as follows. Extracts containing albuminous substances were prepared from yeast, Tuber, and Agaricus, by the method used by BÜCHNER in the preparation of zymase solutions from yeast. These extracts were injected into animals, and after 12–14 days serum from the animals was treated with small quantities of the albuminous extracts. The yeast extract gave a precipitate with the serum of the animal that had been treated with yeast extract, a slight cloudiness with the serum of Tuber, but none

[10] LYMAN, GEORGE RICHARD, Culture studies on polymorphism of Hymenomycetes. Proc. Boston Soc. Nat. Hist. **33**:125–209. *pls. 18–26.* 1907.

[11] MAGNUS, W., and FRIEDENTHAL, HANS, Ein experimenteller Nachweis natürlicher Verwandschaft. Ber. Deutsch. Bot. Gesells. **24**:601–607. 1907.

with the serum of Agaricus. The Tuber extract gave strong precipitation both with Tuber serum and with yeast serum, but none with mushroom serum. The mushroom extract gave a precipitate only with the serum of the animal treated with mushroom extract. From these experiments the writers infer that the yeast is more closely related to the Ascomycetes than it is to the Basidiomycetes. While the precipitin method has been used to a certain extent in attempts to show relationships among animals, too much stress should not be laid on this single experiment with plants. It is possible that albuminous substances from some plants may produce precipitins in the blood of animals that will then react with many plant albumins, just as it has been found that precipitins in animals will affect animals of more and more distant relationship depending on the intensity and duration of the treatment of the original animal.—H. HASSELBRING.

Sand keys of Florida.—MILLSPAUGH[12] has published the results of further exploration of the sand keys of Florida. In 1904 O. E. LANSING, Jr. was sent to examine all the islets lying to the westward of Key West, and his collections, notes, and maps form the basis of the present paper. The vegetation of each islet is mapped in a very effective way. The value of the survey is to enable future students to determine what species have come to the different islets since 1904 and what have been unable to survive; what species come first to such islets; and how species spread when brought into an untainted environment. In a summary it is shown that such species as are able to avail themselves of bird and water transportation, and can withstand or actually need a saline soil and atmosphere, are the species that lay hold of these islets. Wind transportation appears to play no part whatever in the plant colonization of these minute islets. From wide study of such areas in the Antillean region, the author concludes that the order of precedence in the vegetation-covering of the wave-formed sand keys of Florida has been as follows, the method of transportation also being indicated: (1) *Sesuvium portulacastrum* (water), (2) *Cakile fusiformis* (water), (3) *Euphorbia buxifolia* (bird), (4) *Cenchrus tribuloides* and *Cyperus brunneus* (bird), (5) *Uniola paniculata* (water), (6) *Andropogon glomeratus* (bird), (7) *Suriana maritima* and *Tournefortia gnaphalodes* (bird), (8) *Borrichia arborescens* and *Iva imbricata* (bird), and (9) *Ambrosia hispida* (water).—J. M. C.

Pythium and Chytridiaceae.—BUTLER has[13] made an extended study of the genus Pythium. The introductory part of his monograph is a somewhat lengthy account of the habits, structure, and biology of the members of the genus. The observations recorded have for the most part been described by earlier students of the group, and very little that is new is added. An observation relating to the morphology of the sporangia and conidia of the genus is of interest.

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[12] MILLSPAUGH, CHARLES F., Flora of the sand keys of Florida. Field Columbian Mus. Publ. Bot. Ser. 2:191–245. 1907.

[13] BUTLER, E. J., An account of the genus Pythium and some Chytridiaceae. Mem. Dept. Agric. India. Bot. Series 1: pp. 160. *pls.* 10. 1907.